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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,410	02/05/2004	Kyung-yol Yon	1349.1346	3843

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EXAMINER	
VAJDA, PETER L	

ART UNIT	PAPER NUMBER
1756	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/771,410	YON ET AL.	
	Examiner	Art Unit	
	Peter L. Vajda	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,14,15 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,14,15 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The arguments made by the attorney and filed on 02/23/2007 have been carefully considered and addressed. The rejections made previously are restated below with responses to the attorneys arguments found after the rejections. The examiner acknowledges the cancellation of claims 12, 13, and 16 and thereby withdraws the double patenting objection. In view of the applicants remarks the 35 U.S.C. 112, second paragraph, rejection is withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6, and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moudry *et al.* (US Patent Publication 2005/0160938) in view of Brechlin *et al.* (US Patent 4157974).

Moudry *et al.* teach a liquid ink comprising a binder dispersed in a liquid having a Kauri-Butanol number less than 30, a colorant, a functional dispersant, and a charge control agent (p. 2 [0025]). Said binder is defined as an organosol, which is defined as a amphipathic copolymer comprising a marginally insoluble (co)polymeric steric

stabilizer covalently bonded to an insoluble thermoplastic (co)polymeric core (p.2 [0029]). The graft stabilizer may be chemically bonded to the resin core (e.g. grafted to the core) using any number of known reactions (p. 3 [0037]-[0040]), but it is stated that to form stable ink dispersions, the organosol should have the ability to interact strongly, that is, to chemically bond or physically adsorb onto the pigment surface (p. 4 [0045]). Furthermore, the charge director may be incorporated into the toner in a variety of methods, but most preferably by attachment via a functional group of the graft copolymer binder (which is the previously defined organosol (Abstract))(p. 6 [0060]). Therefore, the inventors teach the incorporation of acid and amide functional groups into either the (co)polymeric thermoplastic core or the (co)polymeric steric stabilizer by copolymerizing the organosols with monomers containing said functional groups. Some of the examples listed for amide functional groups are those consisting of (meth)acrylates having aliphatic amino radicals, nitrogen containing heterocyclic vinyl monomers, N-vinyl substituted ring-like amide monomers, aromatic substituted ethylene monomers containing amino radicals, and nitrogen containing vinylether monomers (p. 4 [0047]). Additionally, other polymers may be used in addition with those mentioned such as styrene and styrene/acrylic copolymers, vinyl acetate and vinyl acetate/acrylic copolymers, and acrylic and methacrylic esters (p.4-5 [0048]). The weight ratio of the resin core to the stabilizer shell is on the order of 1/1 to 15/1 (p. 5 [0049]). Furthermore colorant particles are embedded in the thermoplastic organosol resin, including dye and pigments, and in particular surface treated carbon black (p. 5 [0052]). The weight ratio of resin to colorant is on the order of 1/1 to 20/1 (p. 5 [0053]). A charge control agent

may also be incorporated (p. 6 [0060]). The inventors, however, do not specify that the colorants used be first encapsulated by another polymer resin before binding to the organosol.

Brechlin *et al.* describes a liquid developer comprising an insulating carrier liquid with pigment particles encapsulated by polymeric material dispersed therein (Abstract). Furthermore, a second polymer may be added to serve as a protective colloid to disperse the pigmented polymer particles (Col. 5. ln. 3-7). Suitable polymers used for either the encapsulating polymer or colloidal polymer may be copolymers of styrene with acrylic acid esters, which are well known to be thermoplastic (Col. 6 ln. 29-40). Additionally, carbon black is used as the pigment component and a charge control agent is also additionally added (Col. 6 ln. 18-28). In light of these two inventions, it would have been obvious to any person of ordinary skill in the art at the time of the invention to combine the encapsulated pigment particles of Brechlin *et al.* into the amphipathic copolymers of Moudry *et al.* to form the toners having improved dispersability. Since Brechlin *et al.* teach carbon black pigment particles encapsulated by copolymers of styrene and acrylic acid esters, which are said to have improved dispersability, it would have been obvious to include them in the toners of Moudry *et al.* since the toners of Moudry *et al.* are also said to have improved dispersion stability in addition to improved chargeability.

The attorney pointed out that the present invention teaches the use of particles of increased size rather than the finely divided particles taught by Brechlin *et al.* and cites paragraph [0056] of the specification for support. While it is true that Brechlin *et al.* do

teach that good resolution and stability are imparted by smaller particle sizes, the inventors further recite that a range of acceptable, or preferred, particles sizes to achieve these properties be between 0.1 to 12 μm in diameter (paragraph (12), from the portion of text not properly formatted, a copy of which is included with this action). The specification of the present application recites that the particles of the pigment dispersion have particle diameters in the range of 0.1 to 2 μm (p. 3 [0009]), which therefore lie within the range disclosed by Brechlin *et al.* and therefore would not be expected to have divergent characteristics. Further, Brechlin *et al.* teach that a mixture of a polymer and at least one pigment, which may contain conventional additives, are added together and heated so that the pigment becomes encapsulated by the polymer (Col. 5 ln. 50 – Col. 6 ln.12) and then the thus encapsulated pigmented polymers are added to a solvent containing the substance that acts as a protective colloid (organosol) and are then allowed to settle out to form particles smaller than 12 μm which are to be used in combination with solvents to form liquid developers (Col. 6 ln. 65 – Col. 7 ln. 38). Thus, the recitation of the size of the particles of Brechlin *et al.* does not teach away from the present application since the disclosed particles diameter values are inclusive of the particle diameter values of the present application and because the preparation taught by Brechlin *et al.* is similar to that taught by the applicant. Brechlin therefore teaches resin-encapsulated pigment particles as specified in pending claim 1 of the application that possess the size characteristics that do not distinguish them from the present invention.

Claims 1-6 and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moudry *et al.* (US Patent Publication 2005/0160938) in view of Ohsawa *et al.* (US Patent 6679597).

The discussion of Moudry *et al.* above is incorporated here. The inventors, however, do not specify that the colorants used be first encapsulated by another polymer resin before binding to the organosol. Ohsawa *et al.* teach that a colorant may be included in dispersed resin particles, such that a pigment is covered with a resinous material to prepare resin-coated particles, in order to disperse colored particles in a nonaqueous solvent (Col. 19 ln. 27-35). Furthermore, a process is described in which a mixture is formed containing all colorants for the colored particles and an auxiliary polymer for coating said colorants. The mixture is then finely divided and a further dispersion is performed in the presence of a polymer dispersant (Col. 21 ln. 7-33). Suitable thermoplastic (co)polymers for the resin are said to be ethylene-vinyl acetate, polystyrene methacrylate copolymers, polystyrene acrylate copolymers, ethylene-acrylate copolymers, ethylene-methacrylate copolymers, and rosin-based resins (Col. 19 ln. 25-55). Furthermore, carbon black is taught as a pigment (Col. 17 ln. 27-35), a carrier liquid is taught (Col. 18 ln. 66-67 and Col. 19 ln. 1-15), and a charge control additive is also taught (Col. 23 ln. 1-27). In light of these two inventions, it would have been obvious to any person of ordinary skill in the art at the time of the invention to combine the encapsulated pigment particles of Ohsawa *et al.* into the amphipathic copolymers of Moudry *et al.* to form the toners described in the present application. Since Ohsawa *et al.* teach carbon black pigment particles with encapsulated by

copolymers of styrene and acrylic acid esters, which are said to have improved dispersability it would have been obvious to include them in the toners of Moudry *et al.* since the toners of Moudry *et al.* are also said to have improved dispersion stability in addition to improved chargeability.

The attorney pointed out that Ohsawa *et al.* disclose the use of an oily ink. The invention of the present application, as defined by the claims, however, does not specify the type of liquid solution or solvent to be used as a carrier liquid in the invention and provides no direction to preclude an oily carrier liquid. Furthermore, Ohsawa *et al.* teach that their oily inks are comprised of colored particles dispersed in a nonaqueous solvent (Col. 18 ln. 62-65). Suitable nonaqueous solvents are further disclosed to be straight or branched chain aliphatic hydrocarbons (Col. 18 ln. 66 – Col. 19 ln. 15). Ohsawa *et al.* teach that the carrier liquid have a dielectric constant of less than 3.5 and an electrical resistivity of 10^9 Ω or more (Col. 18 ln. 62-65). The applicants similarly recites that the carrier liquid must have a Kauri-Butanol number of less than 30, a dielectric constant between 1 and 5, and an electrical resistivity of 10^9 Ω or more (p. 9 [0035]). Other than the carrier liquid, Ohsawa *et al.* do not teach the inclusion of any other oily materials and therefore, the oiliness of the ink must be derived from the aliphatic hydrocarbon solvent. Taught specifically as a suitable example is Isopar-H, which is known to have a Kauri-Butanol value of 27 (US 4702985, Col. 7 ln. 18-43). The carrier liquids taught by Ohsawa *et al.* therefore have all the requirements that the applicants teach are necessary for the carrier liquids in their invention and therefore the oily properties, since the oiliness comes from the oily, aliphatic carrier liquids, are not

expected to be any different in the invention of Ohsawa *et al.* than in the invention of the applicant. Furthermore, in the inventive example disclosed by the applicant the use of Norpar 12 is taught (p. 11 [0045]). Norpar 12 is well known in the art to be an aliphatic hydrocarbon solvent (see US 6777154, Col 7 ln. 8-17). Both Norpar 12 and Isopar solvents are aliphatic hydrocarbon solvents with similar properties as shown above and therefore have similar characteristics. Furthermore, the applicants describe their carrier liquid as being "oleophilic" which is a substance with an affinity and a compatibility for oils (p. 9 [0035]). Thus, since both inventions employ similar carrier liquids with similar properties and compositions and since oiliness is derived in the invention of Ohsawa *et al.* from the carrier liquid, the two inks must have similar viscosities and therefore levels of "oiliness." Therefore, despite describing the material as an "oily ink" the ink of Ohsawa *et al.* is very similar in its oiliness to the ink of the present invention.

Claims 1, 4-12, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brechlin *et al.* (US Patent 4157974) in view of Moudry *et al.* (US Patent Publication 2005/0160938).

Brechlin *et al.* describes a liquid developer comprising an insulating carrier liquid with pigment particles encapsulated by polymeric material dispersed therein (Abstract). Furthermore, a second polymer may be added to serve as a protective colloid to disperse the pigmented polymer particles (Col. 5. ln. 3-7). Suitable polymers used for either the encapsulating polymer or colloidal polymer may be copolymers of styrene

with acrylic acid esters, which are well known to be thermoplastic (Col. 6 ln. 29-40). Additionally, carbon black is used as the pigment component and a charge control agent is also additionally added (Col. 6 ln. 18-28). The inventors further teach the method of producing said liquid toner in which an encapsulated pigmented polymer is formed (Example Ia Col. 7 ln. 65-68 and Col. 8 ln. 1-7) by homogenization at 160 °C and then crushing of the polymer and colorant. The resultant pigmented polymer was then added to a solution with an aliphatic hydrocarbon (as carrier liquid) containing a copolymer and a dye to be reacted at 150 °C (Examples 1-8). Alternative to those polymers taught in the specific examples, the inventor teaches that any styrene with acrylic acid esters may be employed (Col. 6 ln. 29-40). The inventors, however, do not teach the use of an organosol to bind the toner particles. The discussion of Moudry *et al.* is incorporated here. Therefore, it would have been obvious to any person of ordinary skill in the art at the time of invention to incorporate the improved organosols of Moudry *et al.* into the liquid toner of Brechlin *et al.* since the organosols impart improved dispersion stability and charge characteristics to the toner. The organosols of Moudry *et al.* would have stabilized the encapsulated pigment particles of Brechlin *et al.* since aliphatic hydrocarbons are used and are similar carrier liquids as those taught by Moudry *et al.* p. 2 [0027]). Therefore, addition of the amphipathic copolymer organosol to pigmented polymer particles would have not only been compatible but would have also resulted in a liquid toner with better dispersability and charge properties.

The attorney pointed out that the present invention teaches the use of particles of increased size rather than the finely divided particles taught by Brechlin *et*

al. and cites paragraph [0056] of the specification for support. While it is true that Brechlin *et al.* do teach that good resolution and stability are imparted by smaller particle sizes, the inventors further recite that a range of acceptable, or preferred, particles sizes to achieve these properties be between 0.1 to 12 μm in diameter (paragraph (12), from the portion of text not properly formatted, a copy of which is included with this action). The specification of the present application recites that the particles of the pigment dispersion have particle diameters in the range of 0.1 to 2 μm (p. 3 [0009]), which therefore lie within the range disclosed by Brechlin *et al.* and therefore would not be expected to have divergent characteristics. Further, Brechlin *et al.* teach that a mixture of a polymer and at least one pigment, which may contain conventional additives, are added together and heated so that the pigment becomes encapsulated by the polymer (Col. 5 ln. 50 – Col. 6 ln.12) and then the thus encapsulated pigmented polymers are added to a solvent containing the substance that acts as a protective colloid (organosol) and are then allowed to settle out to form particles smaller than 12 μm which are to be used in combination with solvents to form liquid developers (Col. 6 ln. 65 – Col. 7 ln. 38). Thus, the recitation of the size of the particles of Brechlin *et al.* does not teach away from the present application since the disclosed particles diameter values are inclusive of the particle diameter values of the present application and because the preparation taught by Brechlin *et al.* is similar to that taught by the applicant.

The attorney further notes, however, that the particles of Brechlin *et al.* are homogenized, crushed, and the crushed particles are dyed and argues that the pending

independent claims 1, 7, and 11 of the present invention do not recite homogenizing, crushing, and dying. Claims 1, 7, and 11, however, are product, not process claims, and thus the manner in which the product is derived is immaterial. Since it is the finished product that is claimed, the manner in which Brechlin *et al.* formed their encapsulated, pigmented polymer is not relevant to the claims as written.

Claims 1, 4-12, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohsawa *et al.* (US Patent 6679597) in view of Moudry *et al.* (US Patent Publication 2005/0160938).

Ohsawa *et al.* teach that a colorant may be included in dispersed resin particles, such that a pigment is covered with a resinous material to prepare resin-coated particles, in order to disperse colored particles in a nonaqueous solvent (Col. 19 ln. 27-35). Furthermore, a process is described in which a mixture is formed containing all colorants for the colored particles and an auxiliary polymer for coating said colorants. The mixture is then finely divided and a further dispersion is performed in the presence of a polymer dispersant (Col. 21 ln. 7-33). Suitable thermoplastic (co)polymers for the resin are said to be ethylene-vinyl acetate, polystyrene methacrylate copolymers, polystyrene acrylate copolymers, ethylene-acrylate copolymers, ethylene-methacrylate copolymers, and rosin-based resins (Col. 19 ln. 25-55). Furthermore, carbon black is taught as a pigment (Col. 17 ln. 27-35), a carrier liquid is taught (Col. 18 ln. 66-67 and Col. 19 ln. 1-15), and a charge control additive is also taught (Col. 23 ln. 1-27). The liquid toner is prepared by first polymerizing resinous particles, under nitrogen and heat

and using an initiator, made from vinyl acetate monomers (Preparation Example 1 Col. 23 ln. 30-68 and Col. 24 ln. 1-4), then an oily ink is prepared by first creating a dispersion of nigrosine dye and methacrylate/acrylic acid copolymer. This dispersion was then added to the resinous particles with an alcohol and a carrier liquid to form the ink (Example 1 Col. 24 ln. 5-42). Ohsawa *et al.*, however, do not teach the inclusion of an organosol. The discussion of Moudry *et al.* above is incorporated here. Therefore, it would have been obvious to any person of ordinary skill in the art at the time of invention to incorporate the improved organosols of Moudry *et al.* into the liquid ink of Ohsawa *et al.* since the organosols impart improved dispersion stability and charge characteristics to the toner. The organosols of Moudry *et al.* would have stabilized the encapsulated pigment particles of Ohsawa *et al.* since aliphatic hydrocarbons were used and similar carrier liquids were taught by Moudry *et al.* (aliphatic hydrocarbons are specified (p. 2 [0027])). Therefore, addition of the amphipathic copolymer organosol to the coated colorant particles would have not only been compatible but would have also resulted in a liquid toner with better dispersability and charge properties.

The attorney pointed out that Ohsawa *et al.* disclose the use of an oily ink. The invention of the present application, as defined by the claims, however, does not specify the type of liquid solution or solvent to be used as a carrier liquid in the invention and provides no direction to preclude an oily carrier liquid. Furthermore, Ohsawa *et al.* teach that their oily inks are comprised of colored particles dispersed in a nonaqueous solvent (Col. 18 ln. 62-65). Suitable nonaqueous solvents are further disclosed to be straight or branched chain aliphatic hydrocarbons (Col. 18 ln. 66 – Col. 19 ln. 15).

Ohsawa *et al.* teach that the carrier liquid have a dielectric constant of less than 3.5 and an electrical resistivity of 10^9 Ω or more (Col. 18 ln. 62-65). The applicants similarly recites that the carrier liquid must have a Kauri-Butanol number of less than 30, a dielectric constant between 1 and 5, and an electrical resistivity of 10^9 Ω or more (p. 9 [0035]). Other than the carrier liquid, Ohsawa *et al.* do not teach the inclusion of any other oily materials and therefore, the oiliness of the ink must be derived from the aliphatic hydrocarbon solvent. Taught specifically as a suitable example is Isopar-H, which is known to have a Kauri-Butanol value of 27 (US 4702985, Col. 7 ln. 18-43). The carrier liquids taught by Ohsawa *et al.* therefore have all the requirements that the applicants teach are necessary for the carrier liquids in their invention and therefore the oily properties, since the oiliness comes from the oily, aliphatic carrier liquids, are not expected to be any different in the invention of Ohsawa *et al.* than in the invention of the applicant. Furthermore, in the inventive example disclosed by the applicant the use of Norpar 12 is taught (p. 11 [0045]). Norpar 12 is well known in the art to be an aliphatic hydrocarbon solvent (see US 6777154, Col 7 ln. 8-17). Both Norpar 12 and Isopar solvents are aliphatic hydrocarbon solvents with similar properties as shown above and therefore have similar characteristics. Furthermore, the applicants describe their carrier liquid as being "oleophilic" which is a substance with an affinity and a compatibility for oils (p. 9 [0035]). Thus, since both inventions employ similar carrier liquids with similar properties and compositions and since oiliness is derived in the invention of Ohsawa *et al.* from the carrier liquid, the two inks must have similar viscosities and therefore levels

of "oiliness." Therefore, despite describing the material as an "oily ink" the ink of Ohsawa *et al.* is very similar in its oiliness to the ink of the present invention.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Vajda whose telephone number is 571-272-7150. The examiner can normally be reached on 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CHRISTOPHER RODEE
PRIMARY EXAMINER

PLV 04/18/2007

PLV